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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BEHREND, HARVEY E

ART UNIT	PAPER NUMBER
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3641

DATE MAILED: 02/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/996244

Applicant(s)

Schaefer et al

Examiner

Behrend

Group Art Unit

3681

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Response

A SHORTENED STATUTORY PERIOD FOR RESPONSE IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a response be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for response is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to respond within the set or extended period for response will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on 10/30/02
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-19, 29-34 is/are pending in the application.
- Of the above claim(s) 30-32 is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-19, 29, 33, 34 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 3
- ☒ Notice of References Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

1. Applicants election with traverse of Group A in the 10/30/02 response is acknowledged. Applicants arguments have been considered, however they are not sufficient to overcome applicants own indications that the two inventions are independent and distinct (see section 1 of the 9/26/02 Office action).
2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 4-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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The claims appear directed to a fullerene molecule per se, however, it is not clear from the claim language exactly what is been claimed and, the metes and bounds of the claims are thus undefined.

It is noted that applicant on page 3 of the 10/30/02 response as well as on page 6 of the 7/18/96 response in parent case SN 08/376846, for example, indicates that no utility is being claimed in these claims and thus, these claims appear redundant to claims 1-3.

Further rendering this confusing is that claims such as claims 13 and 15 appear to be specifically directed to a method of use or of what takes place after a specific event occurs.

Claims such as claims 10 and 19 are vague, indefinite and incomplete as to what all is meant by and is encompassed by the term "similar substance".

5. Claims 1-19, 29, 33 and 34 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicants invention is a fullerene molecule having one or more free thermal neutrons trapped therein.

The specification (e.g. see page 5 lines 1+) indicates this trapping of thermal neutrons will take place if one irradiates the fullerene molecules with a neutron flux.

However, there is no adequate description nor enabling disclosure of how and in what manner, it is determined and ensured that thermal neutrons are actually caused to be trapped in the fullerenes and, to remain trapped in the fullerene until they decay or

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until they are utilized in any of the manners set forth in specification. More specifically, there is no disclosure of what causes a neutron from the beam of irradiating thermal neutrons, to penetrate only one wall of the fullerene and to not penetrate, contact, be absorbed in, etc., the opposite wall of the fullerene, such that it will remain trapped inside the fullerene as a free thermal neutron (there is also no disclosure of how and in what manner it is determined that such actually takes place as alleged in the specification).

There is no disclosure of how and in what manner, one can positively determine that the thermal neutron is actually trapped inside the fullerene as a free thermal neutron rather than being bonded to the fullerene or, even just be reflected among the carbon atoms present in the fullerene sample.

As noted by the Board in their decision in parent case SN 08/376846, page 112 of Jimenez-Vazquez indicates that although some tests may indicate that a substance is bonded to a fullerene, these tests do not necessarily prove that the substance is within the fullerene.

Kosvintsev et al on page 43 indicate that neutrons inside a trap can be absorbed by the walls of the traps.

The "example" set forth on pages 7+ of the specification is insufficient as it is not clear from the example as to exactly what the conclusion recited on page 9 lines 18-30 (i.e. that the radiation detected was from the decay of free neutrons trapped inside the fullerenes) is based on.

For example, the actual steps recited in the specification (e.g. see pages 7+) are too vague and incomplete to enable one to make a proper and accurate analysis of exactly what was done, what was detected, etc.

There is no indication of the various possible errors and sources of errors including systematic errors, cumulative errors, instrumentation errors, etc. Such is necessary in determining the validity of applicants conclusions or interpretation of the experimental results.

This interpretation or, even inadvertent misinterpretation of experimental data, as the case may be, goes to the heart of the matter. In any experiment, there will be errors (due for example, to the instruments themselves since no instrument is 100% error free) and, there is data which must be collected and interpreted.

Further, in any experiment there will be errors introduced due to systematic or cumulative errors, as well as instrument errors since all instruments have some error in their measurements, the amount of error being dependent for example on the type and quality of instrument.

Clearly, if the results fall within the limits of experimental error, the results are of no probative value.

In the present case, applicants have not identified all of the various errors nor, have applicants shown that their results fall outside the error limits.

In this same vein, the examiner has shown that gross beta counters (used by applicants in obtaining their results as indicated by page 8 of the specification) are

susceptible to more than just betas and gammas (see page 390 of Boaz et al as evidence).

This in itself could introduce errors which could negate applicants interpretation of their data as being indicative of the presence of trapped thermal neutrons.

As a further possible source of error, it is noted that Jimenez-Vaquez et al in the first column on page 113, state it is not known how much the C₆₀ cage can shield the emission of a beta particle (which is what applicants are attempting to detect).

While the example in the specification indicates the empty vial was weighed, there is no indication that the "sample" was weighed before being placed in the vial, after being placed in the vial, after irradiation and after removal from the vial.

The disclosure is insufficient as to the isotopic content of the "sample" (including all impurities and/or contaminants present).

Such is clearly pertinent to the patentability of applicants invention since these impurities and/or contaminants could be made radioactive by the neutron irradiation and, if they are beta or positron emitters with a half life on the order of 10 minutes, give a false indication of the trapping of thermal neutrons in the fullerenes.

Note in this respect that Braun et al in the second column on page 443 state that commercial fullerenes contain non-negligible amounts of impurity elements which can be made radioactive (activated) by neutron irradiation all of which can lead to erroneous results.

In further regard to this issue of impurities and/or contaminants, it is noted that applicants in part (d) on page 6 of the brief in parent case 08/376846, state that in their

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experiments, the contaminants varied from sample to sample and, sometimes from test to test of the same sample! Such additionally makes it appear that the “sample” could become contaminated at any point during the experimental procedure and, thus, also introduce errors.

If the experimental procedures are such that contaminants can be so introduced (particularly from test to test of the same sample), any conclusions drawn from these experiments would be suspect.

There is no indication of why the various time periods indicated in the example on page 7 of the specification, were utilized.

It is not clear from the “example” as to exactly when the first gamma analysis is performed. However, it appears that there is an initial “window” of at least 14-15 minutes (or even over 30 minutes (see step 8)) after removal from the neutron flux before gamma analysis is performed, and thus, gamma emitters with shorter half lives would presumably be considered as beta emitters and, as erroneous evidence of free thermal neutrons trapped in the fullerenes.

The example is insufficient in failing to set forth all of the contaminants and impurities detected during the analysis (including any contaminants whose decay could be mistaken for the decay of free neutrons). Such would be useful in determining the accuracy of applicants conclusions concerning the experimental results.

The specification on page 9 indicates that there are some pure beta emitters with a half life on the order of 10 minutes. However, it does not appear that such emitters were searched for in the “sample”. The disclosure is insufficient as to how and in what

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manner it was ensured that there were not present any other beta emitters (including non-pure beta emitters or beta emitters which also emit other radiation) with a half life on the order of 10 minutes. The examiner in parent case SN 08/376846 had pointed out to applicant that there are other beta emitters including pure beta emitters (as well as positive beta (positron) emitters) which have a half life of around 10 minutes, e.g. As-79, Rb-91, Mo-102, Cs-139, Ho-154, Ce-131, Cd-119, Fe-53, Cu-59, N-13.

Nucleonics and Hodgeman et al also indicate there are numerous beta emitters (both negative and positive) having a half life close to 10 minutes, any of which could cause interference and lead to erroneous results or a misinterpretation of experimental results. It is not seen wherein applicant has accounted for such.

The disclosure is insufficient as to how and in what manner, the neutrons can be entrapped by controlling the temperature of the fullerenes.

The 9/28/01 Board Decision in parent case SN 08/376846 is still considered pertinent and is incorporated herein. A portion of the Boards statements on pages 6-8 thereof is reproduced herein for applicants convenience.

"We note that appellants' disclosure indicates that prior to the instant invention there was no known procedures for encapsulating neutrons within a fullerene molecule (specification at page 2). Yet, the only procedure disclosed in appellants' specification for capturing thermal neutrons within a fullerene molecule is to expose a fullerene molecule to a neutron flux of 10 to 500 kilowatts for about 5 to 15 minutes (specification at pages 5 and 7).

The specification states that the evidence that neutrons are trapped in the fullerene molecule consists of the presence of pure beta emitters with a half life of ten minutes in the fullerene that remain after the counts resulting from the gamma emitters have been stripped from the raw data.

The appellants' specification also states that there are few pure beta emitters and that fewer have a half life of ten minutes. However, the appellants have not submitted evidence to establish that the beta emitters in the fullerene molecule are not in fact other pure beta emitters. In this regard just because there are few pure beta emitters

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other than thermal neutrons does not establish that these other pure beta emitters are not within the fullerene.

In addition, it is our view that a person of ordinary skill in the art would not be enabled by the appellants' disclosure to ensure that even if thermal neutrons are the pure beta emitters, these thermal neutrons are in fact within the fullerene molecule rather than in the sample outside the fullerene or bonded to the fullerene itself. In this regard, we note that Jimenez-Vazquez at page 112 indicates that although some tests may indicate that a substance is bonded to a fullerene, these test do not necessarily prove that the substance is within the fullerene.

In view of the foregoing, it is our conclusion that the examiner has established a prima facie case of lack of enablement and that the burden has shifted to the appellants to establish that the claimed subject matter is in fact enabled by the appellants' disclosure.

The appellants have presented several arguments in the brief which seek to establish that thermal neutrons are encapsulated within the fullerene. However, argument of counsel is no substitute for evidence. The only evidence submitted by the appellants is a declaration of Joseph W. Talnagi. The examiner has not considered this declaration. The declaration states:

I consider the procedure effective to confirm the presence of free thermal neutrons in a fullerene molecule. I believe that the procedure described in the patent application at pages 7-9 could be easily repeated by a person skilled in the art of neutron activation analysis to detect thermal neutrons trapped in a fullerene molecule.

The above statements are conclusory in nature and the declaration does not include facts upon which the conclusions were based and therefore, even if we were to consider this declaration, it does not rebut the examiner's prima facie case of lack of enablement."

This application contains a "Second Declaration of Joseph W. Talnagi" filed 6/26/02 to presumably overcome the deficiencies noted above by the Board.

However, this Second Talnagi declaration is also insufficient.

This declaration on page 1 states that to obtain the alleged fullerene having one or more free thermal neutrons trapped inside, the procedures outlined on pages 7-10 of applicants specification were followed.

The examiner as set forth above, has noted various deficiencies with the steps outlined on pages 7+ of the specification which could lead to erroneous results. The declaration does not address these deficiencies and hence does not overcome them.

Further, as noted by Hodgeman et al and Nucleonics, there are other beta emitters having a half-life in the range of 6.0-15.0 minutes, other than the ones referenced on page 2 of said declaration, any of which could give erroneous results (the declaration is also insufficient as to why the range was limited to 6.0-15.0 minutes).

Said declaration states on page 2 that the "fullerene used for the experiment was carefully analyzed", but it is insufficient in failing to state what said careful analysis consisted of.

On pages 2 and 3 of the declaration, the declarant states in response to the issue raised by the Board that it is "unlikely" that a free thermal neutron would attach itself to a fullerene or not escape from the confines of the sample and that the "most likely location" for a free thermal neutron would be within the central cavity of a fullerene molecule.

These statements represent the declarants opinion and are conclusory in nature as they are not supported by factual evidence. See In re Pike et al, 84 USPQ 235. No weight is given to an opinion declaration on the ultimate legal conclusion in issue. See In re Lindell, 155 USPQ 251.


6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harvey Behrend whose telephone number is (703) 305-1831. The examiner can normally be reached on Tuesday to Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone, can be reached on (703) 306-4198. The fax phone number for the organization where this application or proceeding is assigned is (703) 306-4195.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

Behrend/kl
January 16, 2003



HARVEY E. BEHREND
PRIMARY EXAMINER